

5 **WHAT IS CLAIMED IS:**

1. A method of validating a communication channel, comprising:
 measuring energy incident at a frequency in a frequency spectrum
 corresponding to a channel but not all frequencies in the frequency spectrum;
 and
10 determining whether the energy measured at the frequency exceeds a
 valid channel threshold.
2. The method of validating a communication channel of claim 1,
 further comprising:
 determining a bandwidth utilized by the channel; and
15 identifying a channel type having a bandwidth approximately equal to
 the bandwidth utilized by the channel
3. The method of validating a communication channel of claim 2,
 wherein measuring energy incident at a frequency includes measuring energy
 at a frequency corresponding to a center of the frequency spectrum;
20 further comprising measuring energy at a second frequency
 corresponding to an edge of the frequency spectrum; and
 wherein determining a bandwidth utilized by the channel includes
 doubling the frequency range from the frequency corresponding to the center
 of the frequency spectrum to the frequency corresponding to the edge of the
25 frequency spectrum.
4. The method of validating a communication channel of claim 2,
 wherein measuring energy incident at a frequency includes measuring energy
 at a frequency corresponding to a first edge of the frequency spectrum;
 further comprising measuring energy at a second frequency
30 corresponding to a second edge of the frequency spectrum; and
 wherein determining a bandwidth utilized by the channel includes
 determining the frequency range from the frequency corresponding to the first
 edge of the frequency spectrum to the frequency corresponding to the second
 edge of the frequency spectrum.

- 5 5. The method of validating a communication channel of claim 1,
further comprising:
 measuring energy incident at a second frequency in the frequency
spectrum;
 comparing the energy measured at the frequency to the energy
10 measured at the second frequency;
 identifying the channel as carrying analog data if the energies
measured at the frequency and the second frequency are disparate; and
 identifying the channel as carrying digital data if the energies measured
at the frequency and the second frequency are not disparate.
- 15 6. The method of validating a communication channel of claim 1,
wherein the channel is valid if the energy measured at the frequency exceeds
the valid channel threshold.
7. The method of validating a communication channel of claim 1,
wherein the channel is not valid if the energy measured at the frequency does
20 not exceed the valid channel threshold.
8. A method of finding a frequency range corresponding to a
channel in a signal, comprising:
 measuring energy existing at two frequencies in a bandwidth of the
signal corresponding to a bandwidth occupied by a channel; and
25 determining whether at least one of the measured energies exceeds a
threshold indicating a channel exists.
9. The method of claim 8, further comprising selecting the
frequency having the highest measured energy and assuming that a channel
is centered near that frequency if at least one of the measured energies
30 exceeds the threshold.
10. The method of claim 9, further comprising searching for
additional channels centered at a multiple of the bandwidth occupied by the
channel from the frequency having the highest measured energy.

- 5 11. A spectrum analyzer, comprising:
 a windowing module having a window input to operate on a plurality of
 samples at a frequency of a communication signal, but fewer than all
 frequencies in a frequency spectrum corresponding to a channel of the
 communication signal and a window output at which the windowing module is
10 to place a window signal representative of the plurality of samples;
 a Fourier transform module having a Fourier transform input coupled to
 the window output to determine energy present in the plurality of samples,
 and having a Fourier transform output at which the Fourier transform module
 is to place a Fourier transform signal representing positive and negative
15 energy present in the plurality of samples incident thereon;
 an absolute value module having an absolute value input coupled to
 the Fourier transform output, to calculate the absolute value of the energy
 present in the plurality of samples, and having an absolute value output at
 which the absolute value module is to place an energy output representing
20 total energy present in the plurality of samples; and
 a comparator having an input coupled to the absolute value output to
 compare the total energy to a valid channel threshold.
12. The spectrum analyzer of claim 11, wherein the Fourier
 transform module performs a discrete Fourier transform.
- 25 13. The spectrum analyzer of claim 11, wherein the comparator is
 further to compare total energy at two frequencies in the frequency spectrum
 to determine a type of signal present in the frequency spectrum.
14. The spectrum analyzer of claim 11, wherein the plurality of
 samples are a portion of a valid channel and the comparator is further to
30 compare total energy at two frequencies in the frequency spectrum to
 determine whether the channel present at those two frequencies is analog.
15. The spectrum analyzer of claim 11, wherein the plurality of
 samples are a portion of a valid channel and the comparator is further to

- 5 compare total energy at two frequencies in the frequency spectrum to
determine whether the channel present at those two frequencies is digital.

16. The spectrum analyzer of claim 11, wherein the plurality of
samples are a portion of a valid channel when the total energy is greater than
the valid channel threshold.

- 10 17. A spectrum analyzer, comprising:
a processor having an input to receive a plurality of samples of a
communication signal, but fewer than all frequencies in a frequency spectrum
corresponding to a channel of the communication signal, the processor to:
combine the plurality of samples;
15 determine positive and negative energy present in the plurality
of samples;
calculate an absolute value of the positive and negative energy
present in the plurality of samples; and
compare the absolute value of the positive and negative energy
20 present in the plurality of samples to a valid channel threshold.

18. The spectrum analyzer of claim 17, wherein the positive and
negative energy present in the plurality of samples is determined by use of a
Discrete Fourier Transform.

- 25 19. The spectrum analyzer of claim 17, wherein the absolute value
of the positive and negative energy present in the plurality of samples
corresponds to a center of the frequency spectrum, and wherein the
processor is further to:
measure energy at a second frequency corresponding to an edge of
the frequency spectrum; and
30 determine a bandwidth utilized by the channel by doubling the
frequency range from the frequency corresponding to the center of the
frequency spectrum to the frequency corresponding to the edge of the
frequency spectrum.

5 20. The spectrum analyzer of claim 17, wherein the absolute value of the positive and negative energy present in the plurality of samples corresponds to a first edge of the frequency spectrum, and wherein the processor is further to:

 measure energy at a second frequency corresponding to a second
10 edge of the frequency spectrum; and
 determine a bandwidth utilized by the channel by measuring the frequency range from the frequency corresponding to the first edge of the frequency spectrum to the frequency corresponding to the second edge of the frequency spectrum.

15 21. The spectrum analyzer of claim 17, wherein the channel is valid when the absolute value of the positive and negative energy present in the plurality of samples exceeds the valid channel threshold.

 22. The spectrum analyzer of claim 21, wherein the processor is further to:

20 measure energy incident at a second frequency in the frequency spectrum;

 compare the energy measured at the frequency to the energy measured at the second frequency;

25 identify the channel as carrying analog data if the energies measured at the frequency and the second frequency are disparate; and

 identify the channel as carrying digital data if the energies measured at the frequency and the second frequency are not disparate.

 23. A viewing device, comprising:

30 a communication adaptor coupled to a cable modem to receive a communication signal comprising a plurality of samples therefrom; and

 a processor having an input to receive the plurality of samples in a frequency, but fewer than all frequencies of a frequency spectrum corresponding to a channel of the communication signal, the processor to:

 combine the plurality of samples;

- 5 determine positive and negative energy present in the plurality
of samples;
 calculate an absolute value of the positive and negative energy
present in the plurality of samples corresponding to a total energy of the
plurality of samples; and
10 compare the total energy to a valid channel threshold.
24. The viewing device of claim 23, wherein the positive and
negative energy present in the plurality of samples is determined by use of a
Discrete Fourier Transform.
25. The viewing device of claim 23, wherein the plurality of samples
15 are a portion of a valid channel when the absolute value of the positive and
negative energy present in the plurality of samples is greater than the valid
channel threshold.
26. An article of manufacture, comprising:
 a computer readable medium having stored thereon instructions which,
20 when executed by a processor, cause the processor to:
 receive a plurality of samples of a communication signal, but fewer
than all frequencies in a frequency spectrum corresponding to a channel of
the communication signal;
 combine the plurality of samples in a window;
25 determine positive and negative energy present in the window;
 calculate an absolute value of the positive and negative energy present
in the window; and
 compare the absolute value of the positive and negative energy
present in the window to a valid channel threshold.
- 30 27. The article of manufacture of claim 26, wherein the plurality of
samples are a portion of a valid channel when the total energy is greater than
the valid channel threshold.

- 5 28. A demodulator, comprising:
 a tuner to receive a communication signal from a cable modem and to
 provide a plurality of samples of that signal; and
 a spectrum analyzer receiving the plurality of samples and to:
 combine the plurality of samples;
10 determine positive and negative energy present in the plurality
 of samples;
 calculate an absolute value of the positive and negative energy
 present in the plurality of samples corresponding to a total energy of the
 plurality of samples; and
15 compare the total energy to a valid channel threshold.

29. The viewing device of claim 28, wherein the plurality of samples
 are a portion of a valid channel when the absolute value of the positive and
 negative energy present in the plurality of samples is greater than the valid
 channel threshold.

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